

INTERIM SQAPP SUMMARY REPORT**TASK 10: LA IN DUST UNDER CARPETS****TASK 10 DESCRIPTION**

Asbestos particles that entered homes in the past may become trapped in a variety of different locations, including within and beneath carpets. To date, EPA has been able to achieve indoor air clearance standards leaving carpets in place, and post-cleanup sampling suggesting that carpets left in place have not significantly re-contaminated living spaces after some time has passed. Thus, asbestos within carpets does not appear to be a major source of concern. However, if a carpet that is contaminated with asbestos is removed, fibers that have accumulated under the carpet could be released to air, potentially causing short-term inhalation exposures of residents or carpet workers, and also potentially causing re-contamination of the home.

The purpose of Task 10 in the Supplemental Remedial Investigation Quality Assurance Project Plan (SQAPP) (EPA 2005) was to collect dust samples that would provide the information needed to characterize the extent of asbestos contamination in dust below carpets and to make preliminary decisions about the likelihood that carpet removal could be a concern. The level of asbestos in dust under carpet is expected to depend on a number of factors, including: a) how long the carpet has been in place, b) the number and magnitude of sources (vectors) that could have contaminated the carpet, and c) the frequency and thoroughness of vacuuming by the resident.

TASK 10 DESIGN

The SQAPP provides detailed information on the study design for Task 10. In brief, sampling locations were selected according to the presence or absence of vectors and the age of the carpet. Vectors are pathways by which asbestos contamination may have reached carpet, such as former residence of a mine worker, presence of unenclosed indoor vermiculite containing insulation (VCI), remodeling of walls or ceilings with VCI, etc. Carpet age was stratified into three categories: 5-10 years, 10-20 years, and >20 years. Survey results provided by current residents helped identify the presence/absence of potential vectors and the approximate age of the carpet. Properties with carpets that had been regularly vacuumed with a HEPA vacuum were excluded. Two properties for each vector classification and carpet age category were selected, yielding a total of 12 dust sampling locations.

All dust samples from under the carpet were collected using the standard microvacuum technique based on ASTM D5755-95 established for use at the site. The area vacuumed consisted of 2-6 templates (each 100 cm²), with the number of areas vacuumed dependant on the amount of dust present beneath the carpet (more templates for low dust loading). In all cases, dust samples were collected from high-traffic areas.

Dust samples from beneath carpets were analyzed by transmission electron microscopy (TEM) using the modified ISO 10312 counting rules, as specified in Attachment E of the SQAPP. The target sensitivity for dust analysis was 200 s/cm².

DUST LOADING RESULTS

The upper panel in Table 1 provides the detailed results for all field samples collected under Task 10. As seen, four samples contained detectable levels of LA, with observed loadings from 180 to 1,600 s/cm².

For the eight non-detects, the analysis sensitivity achieved met the target sensitivity specified in the SQAPP (approximately 200 s/cm²).

Table 2 presents a summary of the dust results stratified by carpet age and vector status. As seen, the four dust samples in which Libby amphibole was detected were from properties with one or more vectors present and older carpets (>10 years).

The lower panel in Table 1 provides the results for all dust field blanks collected under Task 10. As seen, a total of five field blank samples were collected under Task 10. Two of these field blanks were submitted for TEM analysis, and the remaining field blanks were archived. No asbestos structures were observed in either field blank. This indicates that contamination of field samples during field or laboratory activities is not of concern.

CONCLUSION

These results indicates that LA may occur in dust under some carpets, with older carpets in homes with several vectors being most likely to be affected. However, the levels of LA in dust are relatively low, and do not exceed the current action level of 5,000 s/cm² that EPA has established for active cleanup of indoor dust at the site (EPA 2003).

REFERENCES

EPA 2003. Libby Asbestos Site, Residential/Commercial Cleanup Action Level and Clearance Criteria Technical Memorandum. Draft Final. U.S. Environmental Protection Agency Region 8. December 15, 2003.

EPA. 2005. Supplemental Remedial Investigation Quality Assurance Project Plan for Libby, Montana. Revision 1. U.S. Environmental Protection Agency Region 8. August 5, 2005.

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Table 1. Detailed Sample and Analysis Results for Samples Collected Under SQAPP Task 10

FIELD SAMPLE RESULTS

| Address | Sample ID | Sample Date | Sample Location | Carpet Age (yrs) | Vectors (Y/N) | Analysis Method | Grid Openings Counted | Grid Opening Size (mm ²) | EFA (mm ²) | F-Factor | Sample Area (cm ²) | Analysis Sensitivity (s/cm ²) | Total N LA Structures | Dust Loading (s/cm ²) |
|-----------------------|-----------|-------------|-----------------|------------------|---------------|-----------------|-----------------------|--------------------------------------|------------------------|----------|--------------------------------|---|-----------------------|-----------------------------------|
| 271 Mahoney Rd | SQ-00003 | 6/7/2005 | Ground floor | 10-20 | Y | TEM-ISO10312 | 9 | 0.0099 | 1295 | 0.15 | 500 | 194 | 1 | 194 |
| 321 Norman Ave | SQ-00004 | 6/8/2005 | Ground floor | 5-10 | Y | TEM-ISO10312 | 22 | 0.0099 | 1295 | 0.15 | 200 | 198 | 0 | < 198 |
| 215 Main Ave | SQ-00007 | 6/10/2005 | Second level | >20 | Y | TEM-ISO10312 | 8 | 0.0099 | 1295 | 0.15 | 600 | 182 | 1 | 182 |
| 516 Montana Ave | SQ-00009 | 6/14/2005 | Ground floor | 10-20 | Y | TEM-ISO10312 | 22 | 0.0099 | 1295 | 0.15 | 200 | 198 | 8 | 1,586 |
| 250 W. Cedar St | SQ-00011 | 6/15/2005 | Ground floor | >20 | Y | TEM-ISO10312 | 15 | 0.0099 | 1295 | 0.15 | 300 | 194 | 2 | 388 |
| 351 Commerce Way | SQ-00013 | 6/16/2005 | Ground floor | 5-10 | N | TEM-ISO10312 | 11 | 0.0099 | 1295 | 0.15 | 400 | 198 | 0 | < 198 |
| 1314 Dakota Ave | SQ-00015 | 6/16/2005 | 2nd level | 5-10 | Y | TEM-ISO10312 | 15 | 0.0099 | 1295 | 0.15 | 300 | 194 | 0 | < 194 |
| 404 W. 3rd St #A | SQ-00019 | 6/17/2005 | Ground floor | 10-20 | N | TEM-ISO10312 | 9 | 0.0099 | 1295 | 0.15 | 500 | 194 | 0 | < 194 |
| 404 W. 3rd St | SQ-00017 | 6/17/2005 | Ground floor | >20 | N | TEM-ISO10312 | 9 | 0.0099 | 1295 | 0.15 | 500 | 194 | 0 | < 194 |
| 220 Wapiti Dr | SQ-00034 | 6/20/2005 | Ground floor | >20 | N | TEM-ISO10312 | 15 | 0.0099 | 1295 | 0.15 | 300 | 194 | 0 | < 194 |
| 305 Luscher Dr | SQ-00155 | 6/28/2005 | Basement | 5-10 | N | TEM-ISO10312 | 11 | 0.0099 | 1295 | 0.15 | 400 | 198 | 0 | < 198 |
| 1014 Sheldon Flats Rd | SQ-00032 | 7/12/2005 | Ground floor | 10-20 | N | TEM-ISO10312 | 22 | 0.0099 | 1295 | 0.15 | 200 | 198 | 0 | < 198 |

FIELD BLANK RESULTS

| Address | Sample ID | Sample Date | Sample Location | Carpet Age (yrs) | Vectors (Y/N) | Analysis Method | Grid Openings Counted | Grid Opening Size (mm ²) | EFA (mm ²) | F-Factor | Sample Area (cm ²) | Analysis Sensitivity (s/cm ²) | Total N LA Structures | Dust Loading (s/cm ²) |
|----------------|-----------|-------------|-----------------|------------------|---------------|-----------------|-----------------------|--------------------------------------|------------------------|----------|--------------------------------|---|-----------------------|-----------------------------------|
| Not applicable | SQ-00005 | 6/8/2005 | -- | -- | -- | TEM-ISO10312 | 10 | 0.0099 | 1295 | 0.5 | -- | -- | 0 | non-detect |
| Not applicable | SQ-00033 | 7/12/2005 | -- | -- | -- | TEM-ISO10312 | 10 | 0.0099 | 1295 | 0.5 | -- | -- | 0 | non-detect |
| Not applicable | SQ-00010 | 6/14/2005 | -- | -- | -- | ARCHIVED | | | | | | | | |
| Not applicable | SQ-00014 | 6/16/2005 | -- | -- | -- | ARCHIVED | | | | | | | | |
| Not applicable | SQ-00018 | 6/17/2005 | -- | -- | -- | ARCHIVED | | | | | | | | |

Table 2. Dust Loading Results Stratified by Carpet Age and Vector Status

| Carpet Age | Vector Present? | Type of Vector | Address | Dust Loading (s/cm²) |
|-------------------|------------------------|------------------------------------|-----------------------|--|
| 5-10 years | No | n/a | 351 Commerce Way | < 198 |
| | | n/a | 305 Luscher Dr | < 198 |
| | Yes | Outdoor soil | 321 Norman Ave | < 198 |
| | | Outdoor soil; VCI | 1314 Dakota Ave | < 194 |
| 10-20 years | No | n/a | 404 W. 3rd St #A | < 194 |
| | | n/a | 1014 Sheldon Flats Rd | < 198 |
| | Yes | Outdoor soil; VCI | 271 Mahoney Rd | 194 |
| | | Outdoor soil; VCI; Former miner | 516 Montana Ave | 1,586 |
| > 20 years | No | n/a | 220 Wapiti Dr | < 194 |
| | | n/a | 404 W. 3rd St | < 194 |
| | Yes | Outdoor soil | 250 W. Cedar St | 388 |
| | | VCI | 215 Main Ave | 182 |

n/a = not applicable

VCI = vermiculite containing insulation

Non-detects are reported as < sensitivity.